The Psychological Influence of Inquiry-Based Learning on Students' Emotional Intelligence and Well-Being in Education

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Abstract

Introduction: Learners' developmental progress and academic achievement depend heavily on their level of emotional intelligence (EI) and psychological health. There has, however, been limited study on the possible advantages of inquiry-based learning (IL) strategies in generating EI and enhancing health in psychology learners.

Objectives: In the framework of the teaching of psychology, the current research investigates how IL affects students' EI and health.

Methods: A collection of 56 grade 7 children from a pair of classes at various institutions made up the study's pre- and post-test population. Through the use of ANOVA, both inferential and descriptive statistics have been used to analyse the data.

Results: The study's findings showed that the study group's (IL method) kids had the highest levels of accomplishment in science. The learners who received instruction using the IL technique had higher science success for learners who had elevated EI than the learners who are instructed using the traditional learning strategy (control group). When subjected to the traditional teaching methods, the children who had little EI performed better on scientific tests than the study group.

Conclusions: The findings indicated that the impacts of learning strategy and EI on academic performance in science interacted. For children to perform better in science, teachers must employ IL. The EI of kids must be raised for IL to be successful.

Keywords: Emotional Intelligence (EI), Psychological Health, Inquiry-Based Learning (IL), Science, Academic Performance

1. INTRODUCTION

Learning science helps students achieve an excellent standard of life, resolve current societal issues, foster their technical aptitudes and interests, and promote additional science education. Those with appropriate knowledge of science, are adept at applying their understanding of science to other fields of study. Consequently, science instruction in schools needs to start early for the pupils in (Maker, 2020). However, preliminary investigations has revealed that scientific instruction in primary schools (SMP) in Shanghai, China, is still at a relatively low level (Harahap and Baiduri, 2020). In accordance with teacher-centered instruction rather than student-centered instruction may be the cause of low science achievement.

Inquiry-based learning was superior to traditional methods for raising students' science achievement. Students who engaged in inquiry-based learning outperformed those who just received a conventional education in science (Onyema et al.2019).

Inquiry-based learning is beneficial in raising students' levels of science achievement, Science learning and/or accomplishment is influenced by learning variables like interest, motivation, student involvement, and emotional intelligence. The capacity to use psychological data effectively and properly is referred to as emotional maturity. Emotional intelligence predicts academic achievement more accurately than standard intelligence in (Li, 2020).

To raise students' science achievement, science learning should be carefully planned and organised. An inquirybased learning strategy is one of the teaching methods that helps pupils achieve more in science. According to several studies, the three components of emotional intelligence—intrapersonal, modification, and stress management—are strongly related to academic success in (Gerhátová, 2021).

Investigators have discovered a significant connection between academic success and emotional intelligence. A sense of excitement for science-related activities and a positive attitude towards scientific education in (Hanif, 2020).

The aim of this research sought to investigate how students' levels of science accomplishment were impacted by their emotional intelligence and inquiry-based learning strategies.

2. LITERATURE REVIEW

To examine the link between the attributes of emotional intelligence consideration, efficiency, and healing and the three degrees of subjective happiness (low, medium, and high) in teenagers (Guerra-Bustamante et al. (2019)). It is used together with the questionnaire developed by Oxford University and the Spanish-language Trait Meta Mood Scale-24 Questionnaire to evaluate assessed capacity for emotion. The emphasis of the current research concentrates on the necessity of implementing methods that will boost teenagers' raising their perceptions of satisfaction and psychological well-being through increasing their emotional intelligence.

The study (Salavera et al. 2020) examined the hyperlink between well-being, emotional intelligence, and personality; however, more research is needed to determine how well-being, emotional intelligence, and personality predict psychological health well-being in teenagers. Using the SPSS Statistical Package, statistical analyses and relationships among emotional intelligence, both mental and physical health well-being were determined. This results highlight the importance of personality and emotional intelligence in investigating psychological health and provide fresh avenues for further study.

The entire concept of emotional intelligence in (Mishra, 2019) and its applicability throughout the teenage years are discussed in this essay. Psychologists all around the globe utilize different emotional intelligence concepts and components to create training programs to raise emotional intelligence. The report claims that despite several models of emotional intelligence, barely anything has been done to thoroughly examine each model's efficacy.

This study (Zahra et al. (2020)) examined the connections between online gaming, emotional intelligence, psychological well-being, and academic performance among university students. It also evaluated whether the timing of play could affect these variables.

To determine the link between Emotional Intelligence and mental well-being, the inquiry (Malinauskas, R. and Malinauskiene (2020)) project adopted a quantitative longitudinal methodology. The study found a strong correlation between students' psychological assistance and well-being and their emotional intelligence (EI) in the past as well as the present. There is a detrimental association between psychological distress and health, both present and in the past. Particularly, the long-term interactions between EI and wellbeing is not mediated by emotional stress.

The aim of this investigation (Extremera et al. (2020)) was to examine the connections between cognitive ways of regulating emotions techniques, emotional intelligence, and well-being indicators (including mental health and life satisfaction), while considering reference personality traits and demographic factors in our analysis. These results help explain how certain mental techniques for desire management in college students connect to abilities for emotional intelligence and feelings of wellbeing, and they offer an initial basis for research on theories combining aptitude repercussions for wellbeing, emotional intelligence, and cognitive emotion regulation techniques.

In the predominant study (Shuo et al. (2022)), there is an important beneficial connection between post-graduate students' emotional intelligence and well-being. The link between wellness and emotional intelligence might be mediated by the support of others and psychological fortitude, while social support acts as a bridge between the two. The link between emotional intelligence and wellbeing is mediated through social support and psychological flexibility.

The objective of this investigation (Morales-Rodríguez et al. (2020)) was to look into the relationships between university students' psychological health and their self-reported social skills, emotional intelligence, anxiety, empathy, and self-concept. The results of the research could guide the development of innovative educational strategies and interventions that enhance the psychological health of university students around the world.

The final objective of the present investigation (Shafait et al. (2021)) is to investigate how students' emotional intelligence (EI) in Chinese research universities affects their learning outcomes (social, psychological, self-growth outcomes, and happiness with the university experience). For this study, a representative structure of 454 students from Chinese research universities was used. The interactions were examined using the approach of partial least squares approach of psychological element modelling. The data show that EI has a big impact on learning.

3. Methodology

3.1 Research Model

The present research study used a quasi-experimental research strategy to examine the relationship between the variable being examined (scientific learning achievement) and the independent components (high and poor emotional intelligence, as well as inquiry-based and traditional learning methodologies). A 2×2 factorial research plan is shown in figure 1.

	Learning Approach (S)		
Emotional Intelligence (I)		Inquiry (S1)	Conventional (S2)
	Low (I2)	I2 S1	I2 S2
	High (I1)	I1 S1	I1 S2

Table 1. Two-by-two factorial design

3.2 Techniques for research

Preceding to the study, the instructors who would instruct the pupils participating in the experiment about the subject received training on the inquiry-based learning methodology. For an eight-week course, researchers also provided the subject, learning goals, and instructional materials. Teachers, meanwhile, who would teach the subject to the group acting as a control, who only received the subject and coaching goals for an eight-week course of treatment. Educators at both of the schools had the same subject matter and learning goals. Students in both categories had to submit an "emotional intelligence" questionnaire during the first week. This survey was used to gauge the students' emotional intelligence levels and classify them into high and poor categories. Next, the experimentation team engaged in inquiry-based learning for the following weeks, whereas the oversight group experienced traditional learning. It was determined to which the educators adhered to the entire plan instructional steps was also verified by the researcher by observing every phase of learning in the experimental group. To ensure that teachers were using a traditional learning strategy, the researcher also spent four observations with the supervision group.

Tutors presented the subject and laid out the goals for the experimental group's students. They were then split up into five or six smaller groups. Teachers assisted students in identifying and formulating connected issues and theories. Additionally, they assisted students in creating the tools for gathering data and led them in the analysis and testing of their theories. They were asked to formulate their judgements. They were then required to present their pieces. When revision was required, the teachers assisted the students. Finally, during their group presentations, the professors assessed the students' comprehension of the subject under inquiry. They were asked to review the material they had studied at the conclude of the lesson. Four times every week for seven weeks, same operations were repeated.

Using textbooks and other teaching aids, the teachers in the control group presented the subject and had discussions about it. Following that, they responded to questions to gauge how much they understood. The instructors finished up their lessons at that point. The four weekly appointments for those operations lasted for seven weeks. Each group had the same topic and time allotment.

3.3 The Research Sample

The researched population included the entire eighth grade of the middle school in Shanghai, China. After the test for homogeneity was finished, the SMP 3 Shanghai students chosen were assigned to the oversight group (traditional education style). The pupils chosen for the experimental group (using an inquiry-based learning approach) were from SMP 4 Shanghai in China. 58 students made up the study's sample (30 by 30 for both strong and poor emotional intelligence). Each of the four groups had 16 students with strong emotional intelligence and 16 with low emotional level (see Table 2).

Places and types treatment	SMP 3	N	SMP 4
Emotional intelligence	Conventional learning		Inquiry-based learning
Low	14	28	14
Total	28	56	28
High	14	28	14

This study was carried out between August and November of 2019. The science themes included classification of stuff and living things, temperature, and variations in heat. They also included science objects and observations.

3.4 Research Instrument

In addition to an "emotional intelligence" questionnaire, the scholar conducted a post-test to gauge the pupils' levels of science achievement. The tests had 52 questions with many options on both the pre- and post-tests. The questions and answers on the post-test were verified and approved by two seasoned science tutors (teaching science for greater than 10 years). The teachers were chosen from schools other than the sample schools in order to prevent any research conflict. The coefficients of reliability for the questions with several choices were found to be the following: 0.82 (KR-22) and 0.85 (KR-21). It shows that the testing were reliable. There are 32 items in the "emotional intelligence" questionnaire that use the Likert scale. Thirty two questions were taken from the questionnaire used and changed to fit the goals of the current study. Total agreement received four points on the questionnaire, whereas total disagreement received one point. Each student's overall rating was used to indicate their passions.

A pilot research was conducted before the main study with 32 pupils at a Middle school in Shanghai, China. The training materials/documents and data gathering tools were easy to read and comprehend according to the pilot study. The questionnaire's Cronbach's Alpha value has been determined to be 0.832, exceeding the required threshold of satisfactory (0.70) recommended. The analysis of variance was used to examine the data that had been acquired.

3.5 Data Analysis

By categorising variables into two ways (inquiry-based and traditional learning), ANOVA assessed the impact(s) of the key elements and their interactions within a 2x2 experimental factorial design. Low as well as high emotional intelligence categories were used to classify a variable that served as a moderator. When analysing data, standard deviation homogeneity (Levene's Test of Equality of Error Variances) and (one-sample Kolmogorov-Smirnov test) tests were used to determine whether the conditions for statistical analysis were met. The post-hoc variance estimation with Tukey's test or Tukey's Honestly Significant Differences (HSD) is implemented to carefully assess the study's hypothesis when results of the variance evaluation reveal that there is an affiliation among the dependent and independent variables.

4. RESULTS AND DISCUSSION

The study's main hypotheses were that: H1- Its substantial variation in the average ratings of science learning achievement among the two learning approaches; H2 - there was a link between the learning approaches' effects and the students' emotional intelligence levels; and H3 - students' science learning accomplishments improved when they had access to inquiry-based teaching methods and were emotionally intelligent. The data were analysed using SPSS 22.0TM, Statistical Programme for the Social Science. To ensure that the data complied with the requirements of the statistical techniques used to assess this research, the One-Sample Kolmogorov-Smirnov Test and the Levene's Test for the Evaluation of Equivalence of Miscalculation deviations were utilised (see Table 3).

Data Groups	Normality		Homogeneity	
	N	Sig.	Levene's Test score	Sig.
Post-test of the science learning achievement	56	0.719	0.892	0.451

Table 3 shows the outcomes of homogeneity and normality tests.

Table 3 shows that the study's data had a regular distribution and that all modifications were homogeneous (p > 0.05).

Table 4 displays the ANOVA's findings.

Source	df	Sig.	Sum of	Mean Square	F
			Squares		
Learning Approach*Emotional Intelligence	1	.000	3301.786	3301.786	42.96
					3
Total of Reduction	55	-	1928.82	-	-
Learning Approach	1	.023	423.500	423.500	5.511
Emotional Intelligence	1	.879	1.786	1.786	.023
Within Groups	52	-	997.05	18.14	-

Table 4 shows the ANOVA result.

Both the first and second hypotheses of the current investigation were confirmed, as shown in Table 4. Regarding the another premise of the present investigation, the HSD critical value (honestly significant difference) Tukey test was used to determine whether there was any variation between the average ratings of two linked groups (see Table 5).

s of
m (df)

Table 5: Post-hoc Tukey Test Results for ANOVA

The third hypothesis was supported by the post hoc ANOVA with the Tukey test findings, which are presented in Table 5. According to the findings of the Tukey analyse, the crucial amount of Q was 18.19 and the Q table relevant was 5.06. Because the essential Q value was higher than the first entry in the Q table, H0 was refused whereas H1 was accepted. The fourth theory was agreed upon as well. The critical Q value was discovered by the Tukey test to be 9.12, and the Q table relevant was calculated to be 5.06. Due to the bigger crucial amount of Q, H1 rather than H0 was allowed.

5. CONCLUSION

The characteristics of inquiry-based learning techniques may explain a sizable variance in the mean scores of science success between various learning approaches. That instance, the mean scores for the science accomplishment levels for the inquiry-based and traditional learning methods were determined to be 62.88 and 56.39, respectively. To increase students' achievement in science, the researcher advises implementing inquiry-based learning, particularly in science courses, based on the study's findings. The achievement of students in science needs to be raised so that they can live healthy, productive lives, solve societal issues, pursue their passions and abilities, and become technologically literate in the 21st century. To successfully adopt inquiry-

based learning, students' emotional intelligence must also be raised. Further studies on various topics in primary and/or secondary high schools should be conducted, as the research it's only restricted to scientific courses in junior high schools. Additionally, future studies should focus on the outcomes of education in subjects like history, geography, and mathematics.

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